

Mr. Fothergill's



# Success with Seeds

Mr. Fothergill's  
guide to successful  
seed raising



# Success with seeds



I have to say that few things give me as much pleasure as raising plants from seed. It can be substantially less expensive than buying plants and there is a huge choice of varieties. Some are more difficult to raise than others but I hope that, with the help of this guide, I can give you the best chance of success.

Whilst there is a certain amount of care needed when raising seed, after all, you cannot just throw seeds in any old how or at any time of the year and expect good results, taking a little time and trouble to understand and meet their needs will be well rewarded. I believe that anyone can do it and that there are no such things as green fingers – or the lack of them!

## What is seed?

A seed is an incredible feat of packaging. It is a small plant in embryo form, complete with a food store and all protected by a tough outer skin. Kept dry and in cool conditions, it will remain dormant but, in most cases, alive (commonly referred to as remaining viable) for 1 to several years. When a seed is exposed to a favourable combination of moisture and warmth, it should start to take up water. This will cause it to swell and then the skin will burst allowing the embryo plant to start growing. This is known as germination.





## Germination requirements

While I have found that a few seeds require special conditions to germinate, the basic requirements for success are; correct watering, correct temperature, suitable compost/soil, correct sowing depth and, in some cases, light.



### Watering

In my experience, one of the main causes for seeds not germinating is either over or under watering. You should never allow seed to dry out before watering, nor should you waterlog the soil or compost. You should, however, always keep the seed moist.

### Temperature

The range of temperatures that seeds prefer for germination varies considerably but if it is too cold they may rot and if it is too hot they may remain dormant. All my seed packets clearly show the recommended time of year to sow and whether they need to be sown indoors/under glass or can be sown outside.

### Compost/Soil

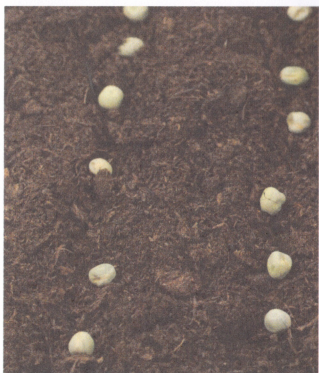
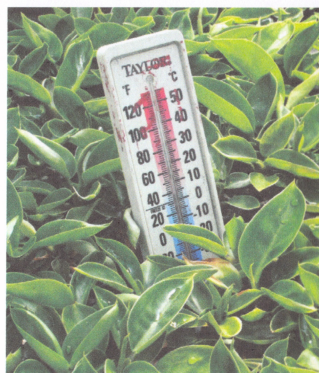
For seeds sown in pots or trays, garden soil should never be used as it may contain weed seeds and other unwanted pests. Rather than garden soil, use a good quality seed or general purpose compost recommended for seed sowing. When planting outside, the soil needs to be broken up to a fine consistency (known as tilth) and be moist but not too wet.

### Sowing Depth

The depth at which seeds should be sown varies considerably with some smaller varieties needing to be at or very near the surface. For the correct depth, always consult the sowing instructions on the back of the packet.

### Light

Although most seeds do not require light to germinate some varieties, as mentioned above, do need to be sown on or near the surface.





The first thing that I would say is – Don't be in too much of a rush to sow your seeds. The sowing periods on the back of my seed packets are there for a very good reason, sowing too early or too late can result in the seeds not germinating. Always use these periods as a guide only as they are based upon the UK average and, therefore, it is best to wait until the soil is beginning to warm up and you feel spring is in the air.



# time of sowing

## Sowing indoors

Many of the plants that fill our gardens with wonderful colours through the summer, and some vegetables and herbs, are not frost hardy. They need a longer growing season than our climate naturally provides. Because of this, you will need to sow these seeds indoors in a greenhouse, in a conservatory, on a windowsill or possibly in a cold frame.

I recommend that, if you aren't using brand new pots, trays, propagators, labels or other growing equipment, they should be well scrubbed using a garden disinfectant and thoroughly rinsed. This will reduce the possibility of disease affecting the fragile young seedlings.

## Compost & containers

When sowing seeds inside or under glass it is best to use a good seed sowing compost, ensure larger lumps are sieved out to allow the young seedlings the freedom to grow. As a tip I suggest that, if you bring compost in from the outside on a cold day, let it warm up before use.

When sowing, you can use any plastic container as long as it is clean and has drainage holes. However, small plastic pots or seed trays are most commonly used. There is no benefit to using larger pots than necessary as the seedlings will not be in them for very long.



For larger seeds that develop deep root systems such as sweet peas and runner beans, you can use extra deep 'rootainers' in seed trays, these will allow transplantation with little root disturbance.

Fill the tray or pot that you are going to use to the rim with your compost then brush off any surplus. Tap the container sharply on the bench or table to settle the growing media then gently firm it down with the base of a similar size pot or tray. Do not overfirm the compost though as this will restrict drainage and root penetration. There should now be enough gap to the top of the tray or pot so that, if it is necessary to cover the seeds with further compost, it will not reach the top.

## Sowing

I have found that one of the most common mistakes made during sowing is that, when told to water the pots or trays well, gardeners will pour water onto the top of the compost. This will simply compact the compost and undo all the careful work you have done so far. The best way to water is to do so from the bottom – stand the trays or pots in about 2cm of water and leave them until the surface becomes wet. Then remove them and allow to drain for at least 30 minutes.

Most seed packets clearly state that the seeds should be sown thinly. However tempting it is to add a few

more 'just in case', always stick to the instructions. Sowing seeds too thickly will result in poor growth due to overcrowding and the seedlings competing with each other. Another consequence is that the seedlings may become more prone to disease and be more difficult to transplant.

Larger seeds are easy to position with your fingers but small ones are more of a challenge, it is easier to sow and see very small seeds if you first mix them with fine dry sand.

Very fine seeds should be pressed gently into the surface but left exposed. Seeds which require light should be treated similarly. For all other seeds follow the instructions on the seed packet but a good rule of thumb is to cover to a depth of about three times their diameter. To cover small to medium seeds with a thin layer of compost, why not try using a fine flour sieve. Alternatively, I recommend using fine vermiculite as it holds more moisture than compost but is very well aerated. It is also sterile and won't form a layer that could be lifted by the germinating seedlings.

Only very large seeds such as beans, marrows and nasturtiums require a different approach and I have found that they are best inserted into individual small holes of the appropriate depth.

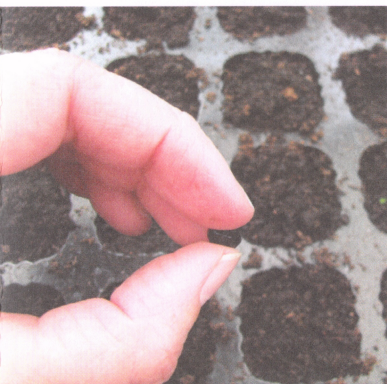
If you don't have a propagator, you can achieve nearly the same effect by covering the tray or pot with cling film or a sheet of glass or plastic. This reduces evaporation and the chances of the seeds drying out. Simple plastic propagator lids, which are an alternative to this, are very easy to fit over a standard seed tray and are an option that I can thoroughly recommend.

Your pots or seed trays should now be placed where a temperature of 18-24°C can be maintained which they need to germinate. While



this can fall a little at night, warm conditions must be maintained at all times. I would suggest monitoring temperatures with a maximum-minimum thermometer. Where you cannot guarantee the temperature, I would recommend the purchase of a heated propagator although, the sowing of some seeds can be delayed until nights are less cold. If you are germinating seeds on a windowsill, you should move them to a warmer location overnight. Seeds that require high temperatures, such as greenhouse cucumbers and pelargoniums, can be germinated in an airing cupboard. However, it is essential that they are removed as soon as the first shoots start to appear.

For seeds which need light as well as warmth, the containers need to be placed in a well lit location but out of direct sunlight. For other seeds, particularly small ones sown on the surface, a dark place is preferable. They could also be covered with newspaper to exclude most light until they germinate. Be careful not to leave your propagators or covered seed trays in a place where they can receive too much sun or excessive daytime temperatures, for example, a sunny windowsill or an unshaded greenhouse.





# Care after sowing

Once sown, your seeds should be examined at least once a day. Further watering should not be required before germination unless the surface of the compost shows any sign of drying out.

At the first signs of germination, remove any paper cover and, if the tray or pot is in a dark place, transfer it to a location where it is in full light, still equally warm but not in direct sun. When germination is well under way, remove the glass or plastic cover so that air can circulate around the seedlings. You should remember that when several different varieties are sown in the same container, not all of the seedlings will start to appear at the same time.

When most of your seeds have germinated, reduce temperatures by moving the trays or pots to a slightly cooler location. Those on a windowsill should be turned daily due to the seedlings' tendency to grow towards the light. You must ensure the seedlings are kept moist at all times but, to avoid over-watering, always wait until the compost surface starts to dry before carefully watering again. The seedlings will not require feeding at this stage as their own food stores and nutrients in the compost will be sufficient.



## Growing On

As seedlings which are not already in cells or plug trays become large enough to handle, they should be transplanted to other containers to give them more space to grow. This is known as 'pricking out'. The fresh trays, cells or small pots should be filled as before, using general purpose compost. The right time for pricking out is usually when seedlings have developed their first

set of true leaves but some plants, such as petunias, which have very small seedlings may need to develop more than one set before they are ready. Seedlings should not be left too long as their rapidly growing roots quickly become difficult to untangle and relocate without causing damage.

Seedlings should always be lifted carefully using an implement such as a pencil or an old fork from the kitchen. If they are too crowded to lift singly, lift them in clumps and then, gently, tease them apart causing as little damage to the roots as possible. Some, such as lobelia, can be left in small clumps. Seedlings should always be held by their leaves, never by their stems as, if the stems get crushed, the plants will die.

Drop the roots of each seedling into a hole in the fresh compost, firming it in gently afterwards. In trays, the holes should be about





3cm apart. I suggest planting the seedling slightly deeper than it was before to ensure that it is well supported and won't fall over. This is particularly important for seedlings such as tomatoes, which tend to have a long stem below the first leaves (the seed leaves or 'cotyledons') but the lowest leaves should always be above the compost surface. When pricking out is complete, pots or trays should be watered from below or gently from above with a fine rose. You must never use very cold water on seedlings at any time.

If you are growing a mixed variety, don't just prick out the largest seedlings and discard the rest as it is common that not all of the colours germinate at the same time or rate. Unless all the seedlings are given an equal chance, it is possible to end up with only one or two of the colours.

For growing on, the pricked out seedlings need to be returned to a position where the temperature

crowded before they can be planted out, don't be afraid to 'pot them on' again into larger cells or pots.

Before they can be planted outside your seedlings will need to get used to the conditions in your garden. Plants in the protected environment of a windowsill or greenhouse are rather soft and may suffer if placed directly outside. To acclimatise them to life in the open air, you should put them outside in a warm and sheltered spot during the day and bring them in again at night for a period of about two weeks. This process is referred to as 'hardening off'. An alternative to moving seedlings in and out is to transfer them to a cold frame (a frame in the garden with a transparent glass or plastic top that can be raised and lowered) where they can be covered over at night.

### Planting Out

When all danger of frost has passed, typically around the end of May or first week of June, planting out can begin and should

be completed as quickly as possible. Most plants need a reasonably fertile soil which should also be weed-free. Ideally you will have dug it over and enriched it with compost or other well-rotted organic matter beforehand. If possible, you should dress the soil with a general fertiliser, or,

better still, pelleted poultry manure or a slow release fertiliser.

Water your plants well before you gently remove them from their trays or pots and plant them carefully, spacing them according to the directions on the seed packets. Finally firm them in well and water thoroughly.

## Direct sowing in the garden

You will find that many vegetables, herbs and flowers can be sown directly in the garden. Some root crops and annual flowers only do well if sown directly in their final positions. Others are best sown in a seedbed (see next page) and transplanted to their permanent positions when large enough. As a general rule of thumb, don't start sowing until annual weeds such as nettles are growing vigorously and the soil has dried sufficiently so as not to stick to your boots.



### Soil preparation

Seeds will not perform well if the soil is heavy and wet or very compacted. However, very light soils can also give poor results as they dry out too quickly. Garden soil needs to be moist but well-drained and aerated just as much as seed compost. Few soils are naturally perfect and for all of these reasons good soil preparation is important if you want your seeds to germinate well and your plants to thrive.

Your best plan is to dig the area well in advance and incorporate generous amounts of compost or other well-rotted organic matter which improves the structure of heavy soils, and the water-holding ability of lighter ones. My advice is to dig heavier soils in the autumn so



and light are similar to their previous location. They should then be kept moist but no feeding should be necessary until they are well established. After that, they will need regular feeding with a balanced liquid fertiliser at the manufacturers' recommended rates. If they become overly large or



that frosts can help to break them down. The heaviest soils can also be improved by adding 'sharp' sand or grit at this time. Most seeds germinate best in soil that has a neutral pH. If your soil is very acid, lime should be applied to bring its level closer to neutral. A dressing of a general purpose fertiliser, applied about a week before sowing, can also be of benefit.

Just before you sow, when the soil is moist but not wet, fork the area over lightly, removing any weeds and larger stones. Break down the larger lumps and rake the area level. When all this has been done the surface layer should have a fine crumbly consistency or 'tilth'. Only when you have this kind of surface should the seeds be sown.

### Seedbeds

A seedbed is a small area of your garden specifically set aside for the raising of your seedlings. It is best constructed in a sheltered, but not shaded spot and should be easily accessible. In such beds it is much easier for you to give slower growing and more delicate plants the extra attention they need. Raising seedlings in seedbeds is particularly valuable for plants such as wallflowers and easily transplanted vegetables such as brassicas (cabbages, cauliflowers etc.), particularly those with expensive seeds.

Construction of a seedbed is essentially the same as the preparation of any other area for seed sowing. On poorly drained soils, a raised seed bed can be made within an edging of timber. If your soil is not good for seed raising, your bed can be made of imported topsoil. As your seedlings aren't going to grow to full size there, the rows in a seedbed can be quite close together - about 15cm apart will be fine.

## Use of cloches & fleece

You might not be aware but, the sowing dates of many vegetables and some hardy flowers can be brought forward by two weeks or more by using cloches to warm the soil and protect the seedlings during germination and early growth. These low, transparent covers like miniature greenhouses or polythene tunnels come in a wide variety of shapes and sizes and can be made of glass or plastic. They also help to keep off certain pests such as birds and rabbits, and protect your young plants from wind, hail and excessive rain.

To get full benefit from cloches, you should prepare and cover the area about two weeks before sowing. You should remember, however, that the night temperature under a cloche is only a degree or two higher than that outside. This means that there is a limit to how much earlier you can sow even with this kind of protection.

It is important not to leave cloches on for longer than they are needed as disease problems can increase as plants become larger and more crowded and they may suffer damage once they start to touch the glass or plastic. However, sudden removal should be avoided as this may also lead to your plants being damaged or their growth severely



checked. If the design of your cloche allows it, it would be best to gradually increase ventilation over a 1-2 week period. Your plants can then be fully acclimatised to life in the outside world by removing the cloches by day and replacing them at night for several more days.

Fleece is a very light, fabric-like material that can be used to protect your early sowings in much the same way as a cloche. It admits light and, unlike glass or plastic, also lets in rain and air. Unlike cloches, fleece is easily blown away and needs holding down at the edges with pegs, bricks or lengths of timber but it can be left in position over some vegetable crops until they are fully mature.

Cloches and fleece can also be used to advance planting out seedlings raised under glass, they are also valuable for protecting the early growth of new potatoes and the flowers of strawberries from late frosts, for extending the season of some crops in autumn and to give overwinter protection to autumn sown vegetables such as lettuce and broad beans.







## Sowing techniques

It is possible for many annuals, including some wildflowers, to be successfully sown by simply scattering their seeds over the soil surface and then raking them in. The main drawback to doing this is that the resulting seedlings can be difficult to distinguish particularly where, like ornamental grasses, they resemble common weeds.

You can sow large seeds, such as beans, individually by pushing them into loose soil with your fingers. Most, however, are best sown in shallow furrows, commonly known as 'drills'. To create these drills you

will need a suitable implement to make the furrow such as the corner of a draw hoe or the end of a cane. If you are using drills for flowers, why not be creative with your shapes – try spirals or concentric circles for instance. Straight drills, however, are normally used for vegetables and in seedbeds. Drills created for peas have a flat bottom about the width of a spade.

If the soil is dry, water the bottom of the drill before you sow thinly. After sowing, cover the seeds lightly with soil. As with sowing under glass, a covering of around three times the diameter of the seed will be about right.

Even where your seeds have been sown thinly, if germination is good, it's likely that the seedlings will soon become crowded. In almost all cases they will need to be 'thinned' and this is best done as soon as they can be easily handled. Choose the strongest plants closest to the spacing recommended on the seed packet, then carefully remove the surrounding plants. With some vegetables, such as carrots and lettuce, the plants removed can be eaten and it may be desirable to thin these gradually rather than completing the whole job in one go.



Seedlings in a seedbed will also need to be thinned out if too crowded to give the others room to grow sufficiently. All those left, however, can eventually be lifted carefully and either transferred to a separate nursery bed to grow on further or be planted out in their final positions. This is generally referred to as 'transplanting'. If plants taken out during thinning are removed carefully with most of their roots, they can often be transplanted as well and can be used to fill gaps in a row. Transplanting direct sown seedlings is done in exactly the same way as planting out those raised under glass except that, being plants grown outdoors, they require no hardening off and the planting out date does not necessarily have to be after the last frost.

## Care after sowing

Where possible, try to hoe regularly between rows to keep down the weeds. Within rows and on seedbeds some hand weeding is usually necessary although, if you are not certain what the seedlings will look like, it is best to wait until they are showing well and you can clearly distinguish your seedlings from the weeds. If there is a period of dry weather before the seeds germinate, water them regularly to keep the soil moist. Remember that, in most cases, the seeds will be close to the surface and the soil can quickly dry out to that depth.







# notes on selected types of plants

I think it is safe to say that, if the correct methods are followed, the raising of most seeds is quite easy. A few, however, can sometimes be more of a challenge and additional advice on some of these, together with notes on the main seed groups, are what I have tried to address here.

## Vegetables: Root Crops

You should not be in too much of a hurry to sow these if the soil is cold and wet and never use old parsnip seed from a previous year. Avoid sowing on ground that has been recently manured and, on heavy, shallow or stony soils it may be best to grow one of the short-rooted varieties.

### • Carrot

Try sowing regularly every three weeks, this way you can ensure a continuous supply of young roots. If you have had trouble with carrot fly you should delay your sowing until May and, to prevent your roots from splitting, keep your carrots well watered during dry spells.







### • Parsnip

To grow the best possible crop, plant your parsnip seeds in deeply dug soil where as many stones as possible have been removed. Due to the slow growing nature of this crop, I would recommend planting faster growing crops such as radishes between the rows to make the most of your space.



### • Beetroot

A good idea to extend your cropping season is to harvest alternate beets when they are the size of a golf ball. This will provide you with some early 'baby' beets and the rest of the crop will have more space to develop. A word of advice when you are harvesting – twist the leaves off rather than cutting them. This will prevent the colour 'bleeding' and remember, the young leaves are also edible and you can cook them like spinach.

## Brassicas

Leafy brassicas (Broccoli, Brussels Sprouts, Cabbage, Cauliflower, and Kale) are normally sown in a seedbed and then you will need to transplant the seedlings to their final positions. If the soil is acidic, lime both the seedbed and the planting area as brassicas do not grow well under such conditions. They also need firm ground so only very light surface cultivation should be carried out before sowing or transplanting. For an early start, you can raise seedlings of some varieties under glass where the germination temperature is usually about 15°C.

### • Cabbage

If you have a small garden, look out for the more compact varieties which will make the most of your limited space. With such a number to choose from, you can find cabbages that will be ready for harvest in spring, summer, autumn or winter. Protect your crop from birds and caterpillars by covering them with suitable netting or fleece.

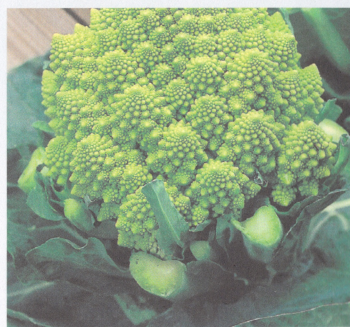
### • Cauliflower

A tip to protect the heads or 'curds' of your cauliflowers from direct sunlight is to snap the outer leaves and turn them over the curds. When feeding your crop, always use a slow-release fertiliser as faster releasing ones can cause unevenness in their growth.



### • Broccoli

As its name suggests, autumn broccoli crops in the autumn. The plants will produce large heads you can cut. After they are cut, side shoots will be produced that you can also harvest. Sprouting broccoli is usually sown later than the autumn varieties and will give you a harvest of multiple 'spears' the following spring which will have smaller heads and tender stems.

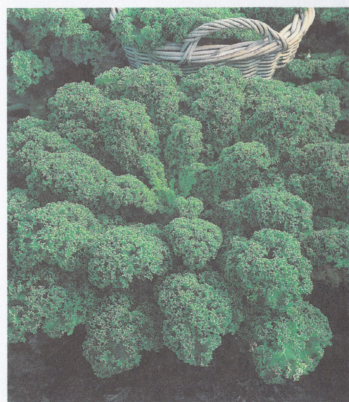


### • Brussels Sprouts

When harvesting sprouts, the earliest produced will be at the bottom so always start from there and work upwards. A point that is often forgotten is that the loose 'cabbage' tops are also edible.

### • Kale

If you sow kale outdoors up until June, you can harvest mature plants from December through to April. If, however, you sow until September, you will also get a good supply of baby leaf. To extend the life of your harvest, pick a few leaves from each plant as required. In December, if you cut the crown of the plant, you will encourage fresh side shoots.





# Salad Crops

Good soil preparation and plenty of water in dry spells are essential for salad crops. Plants will struggle and will often flower prematurely or 'bolt' if the soil is poor or they become dry at the root. A good place to sow is in the dappled shade between rows of taller, slower growing vegetables. To extend the growing season, I suggest protecting early and late sowings with a cloche.

## • Lettuce

This is a great crop if you are restricted to patio growing as there are many varieties that can be grown in containers and for 'cut and come again' baby leaves. If you want the crispiest, freshest harvests, pick the leaves in the cool of the early morning or the evening.

## • Rocket

This is a quick and easy to grow crop and the leaves have a strong flavour. They are a particularly good choice for well watered containers and for baby leaves.



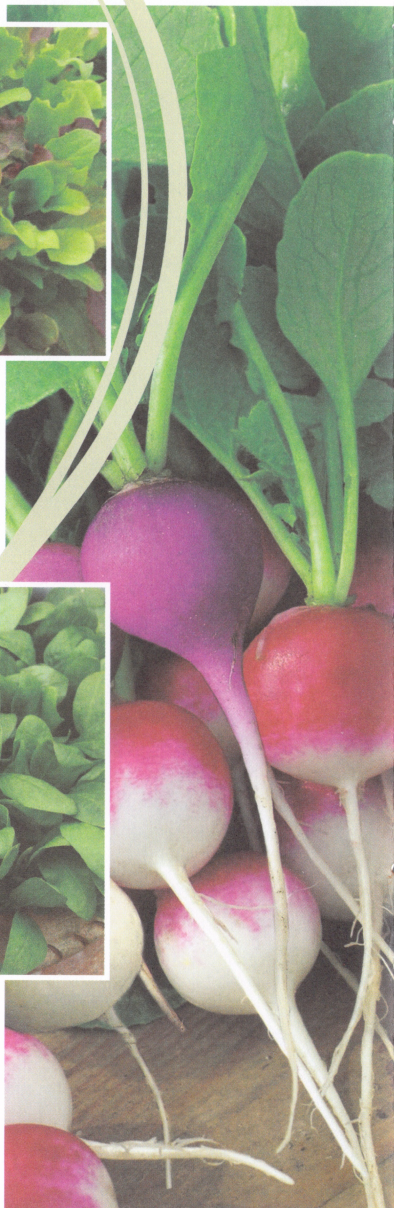
## • Spinach

If you have an area of garden that is in partial shade, this is an ideal crop as excess heat will cause it to 'bolt'. For this reason, mid-summer sowings are best grown only for baby leaf.



## • Radish

For the best quality harvest, I advise you to pick these roots when they are small. To keep the harvest going, I would sow little and often and water regularly. This will aid fast growth and help prevent the roots going 'woody'.





## Onions

It is important to grow your onions in a sunny position on well drained soil as they dislike wet conditions. Their narrow leaves make it difficult for them to compete for light with weeds so you will need to keep your onion beds well weeded.

### • Bulb Onions

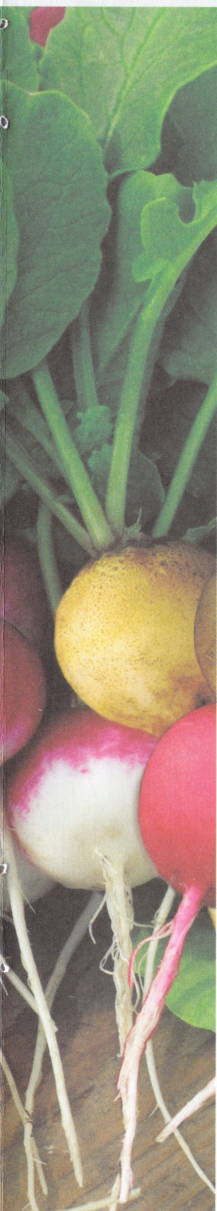
You can encourage your onions to ripen by gently turning down the foliage as it starts to turn yellow. Allow the bulb to dry before storing in a cool, dry room.

### • Spring Onions

These are another great crop for growing in containers or pots of compost on a patio or where space is limited. If you thin out alternate onions from the row, you will leave enough space for the others to grow on and you can use the 'thinnings' in salads.

### • Leeks

To help your leeks through a long growing season, apply a slow release fertiliser to your leek bed just before sowing.



## Squashes

All squashes enjoy a sunny position and fertile, moist soil. It will pay you to add plenty of compost or well rotted manure to the soil before sowing. Keep the plants well watered – especially when fruiting begins.

### • Courgette

To encourage your plants to continue cropping through the season, harvest your courgettes regularly.

### • Pumpkin & Winter Squash

If you place straw under the squashes, it will protect them against rotting if the ground is wet. The occasional use of a liquid feed will also be of benefit. The time for you to harvest is when the fruits have matured and their skins hardened.

### • Summer Squash

Unlike the winter squashes, you should harvest these when the fruits are still young and tender. If you need to save space I suggest that you grow these up a trellis, it will also improve the air circulation.



## Sweet Corn

To help with the wind pollination of the cobs (essential for your cobs to mature as insects do not pollinate these plants), you should sow your sweet corn in blocks. However, it is important that you isolate different types of sweet corn as cross pollination can spoil the quality of the crop. When the 'silks on the cobs turn brown, your crop is ready to harvest.



## Peas & Beans

For a good crop of peas & beans, you will need to ensure that the soil is fertile and kept moist. I suggest that you dig in lots of organic material before planting as this will help to retain moisture in the soil. If you pick the beans regularly, you will promote further cropping.



## Flowers:

### Half-hardy annuals

This is one of the largest groups of flowers we grow and includes many of those known as 'bedding plants'. All have been developed from plants which grow in warmer climates and although, given reasonable weather, they do well in our gardens during the summer, they are unable to survive frost. Some can be sown directly in the garden if sowing is delayed until the soil is warm in late April or May but, for the best possible results, all should be sown earlier under glass. Some half-hardy perennials, such as begonias and geraniums (pelargoniums), are also treated as half-hardy annuals and grown in the same way.







## Sprouting Seeds

These are incredibly easy to grow and are highly nutritious. You can grow sprouting seeds indoors all year round regardless of the weather outside. You can use them as fresh shoots in salads, sandwiches and stir fries or you could grow them on to harvest as 'micro-leaves' when the first true leaves appear.

## Hardy annuals

These differ from half-hardy annuals in that they are able to survive moderate frosts and can all be sown direct in the garden, either in spring or, in some cases, in the autumn. Most dislike being transplanted and you should sow them where they are to flower. A few however, can also be treated as half-hardy annuals and sown under glass to encourage earlier flowering.





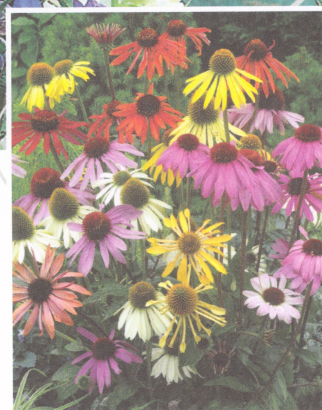
## Hardy biennials and perennials

Whether they live for only two years (biennials) or many (most perennials), these are commonly sown directly in a seedbed in late spring to early summer (about June) and transplanted to their permanent positions in autumn to flower the following year. Varieties with very small or expensive seeds can be germinated in seed trays located in a sheltered position, like an open cold frame, and then the seedlings can be transferred to a nursery bed to grow on.



There are a number of hardy perennials which will flower in the first year, if sown early enough, and these are raised under glass in the same way as half-hardy annuals. They are often referred to as "first year flowering perennials". On the other hand, some perennials, particularly most trees, shrubs and

bulbs but also some herbaceous types, are slow to develop and may require two or more years growth before flowering. There are also a few hardy perennials, such as pansies and some dianthus, which are commonly treated entirely as half-hardy annuals and only retained for a single season.



### **Primula** (including primroses and polyanthus)

The main problems you will have with germinating primula seeds are that they tend to be slow to start and require both cool conditions and light. They may not germinate at all if temperatures rise above 20°C while 15°C is about right. Sow all varieties on the surface of soilless compost and then cover very lightly with seed-sowing grade vermiculite. Cover each tray or pot with a sheet of glass and do not allow to dry out at any time. When the seedlings start to emerge remove the glass.

Our native species germinate best if they are subject to a period of cold. They are best sown outside in the autumn but still using a soilless compost, as above. Other species and varieties can generally be sown under glass from January to March, as long as there is sufficient ventilation to keep temperatures within the required range on sunny days. However, in most cases, delay sowing until between March and June and do so in a shady cold frame.





### Seeds which require cold

Most seeds ripen in late summer or autumn and, to ensure they don't germinate until more favourable conditions in the spring, many trees, shrubs and alpine, a few garden plants and some wildflower seeds, will remain dormant until they have experienced a period of cold.

These seeds are normally sown outdoors in autumn to germinate in spring and it is best done in a seed tray or small pots using a soil based John Innes seed compost. To prevent growth of mosses and liverworts, cover the surface of the compost with a fine layer of horticultural grit.

When sowing is complete, the containers should be placed in a sheltered, shady place such as a cold frame or against a north wall. In spring they can be brought into a greenhouse or conservatory. Here they will get some gentle warmth to hasten germination.

As an alternative, I have sometimes mixed the seeds with a little moist sand or vermiculite and sealed them in a plastic bag then placed them in the bottom of a normal domestic fridge for 6-8 weeks. After this I removed them and sowed the mixture using normal 'under glass' methods. This method to overcome dormancy is known as 'stratification'.

### Sweet Peas

You have three sowing opportunities for sweet peas, autumn (September to October), late winter (January to March) and spring (April to May). Autumn and winter sowings give you the best results and should be under glass, although autumn sowings can also be made in a cold frame. Spring sowings can be made directly where the plants are to flower.

Under glass you should use a soilless compost and 12cm pots with 5-7 seeds in each pot though peat pots and root trainers can also be used. Sweet peas are not difficult to germinate and most will grow perfectly well if you sow them in the normal way. If you have varieties with hard, black or mottled seeds, you may get better germination if you 'chip' them (see other hints & tips). Never chip brown or wrinkled-seeded varieties.

If they are to make sturdy plants, the seedlings need cool conditions at all times. Seeds will germinate happily at 12-15°C and, once the seedlings are through, you should

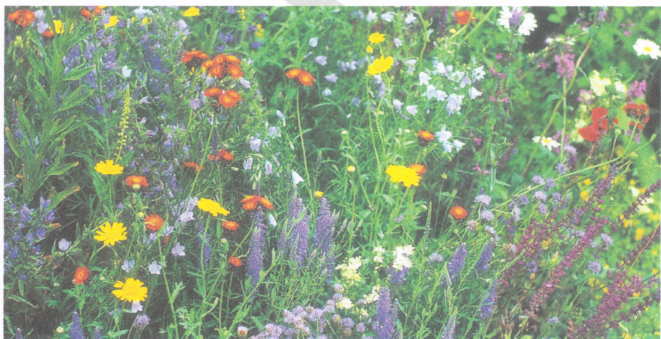


keep them in a cold greenhouse or a cold frame. During periods of hard frost, extra protection should be provided such as covering with fleece but no heat is required and maximum ventilation should be given whenever conditions allow. Frames should only be closed when there is a frost or heavy rain.

### Wildflowers

Our native wildflowers can be hardy annuals, biennials or perennials and their basic requirements are much the same as for others in these groups (but see under Primula for Primrose and Cowslip). Some, such as Foxgloves and Primroses, make excellent

border plants and most can be raised in seed trays or beds using the methods described for garden flowers, although germination is rarely as rapid or as uniform. Mixtures of annual and perennial types can be sown directly with grasses to create wildflower meadows.







## Other hints & tips

- Plan your seed sowing requirements well in advance to ensure you have everything you require in the amounts you need. Remember that some newer and more unusual types may be in limited supply and stocks of particularly desirable varieties may be sold out before the end of the season.
- After you have purchased your seeds, store those that will not be used immediately in a cool, dry place such as a garage - not in a damp shed or hot kitchen. Never put your seeds in polythene bags or store them with things like onion sets as these can sweat and make them damp. If you don't use all the seed at one time, reseal the opened packets as well as you can and then place them in an airtight container.
- Plastic vials give the best protection for delicate seeds but, despite your best efforts to prevent

it, static may sometimes cause the seeds to stick to the sides. This does them no harm and a sharp tap will often discharge the static but the best method is to pour a little very dry silver sand into the tube and shake. You should then be able to pour out and sow the seed with the sand.

- Particularly hard seeds, such as Cannas and black-seeded varieties of sweet peas may not germinate well unless they are chipped to help them take up water. This can be done by making a small nick in the seed coat with a sharp knife, being careful to avoid the scar on the seed which marks the position of the embryo inside. A safer and less fiddly method I prefer to use is to line a jar with coarse sandpaper facing inwards, place the seeds inside, screw on the lid and shake until the surfaces of the seeds are scratched or roughened. Alternatively, soak the seeds overnight and give the chipping or jar treatment just to those that fail to swell. Some research on sweet peas, however, suggests that soaking may sometimes cause stress and may actually reduce germination.
- Label all batches of seeds as you sow them. Don't rely on memory which can be fallible.
- When directly sowing annuals which you haven't grown before, I recommend that you keep back a few seeds and sow them in a pot of compost. This will help you to distinguish those in the garden from any weeds that may appear with them.
- After you have sown your seeds, don't throw away the empty seed packets. Most give information that will be valuable later, such as plant heights and how far apart to space plants when they are thinned, transplanted or set out.





# problems

All your garden plants can suffer from pests, diseases or other problems and seeds and seedlings are no exception.

## Birds

Certain birds can be very damaging to some seedlings, particularly brassicas. Where they are troublesome, covering with a fine mesh net raised a few inches off the ground will give good protection.

## Cats and Dogs

Freshly made seedbeds are extremely attractive to these pets, particularly cats. Their excavations bury some seeds too deeply, expose some where they can dry out and move others to where they are not wanted. Young seedlings also be buried or uprooted and the result can be large gaps and seedlings appearing all over the place.

Although repellent chemicals and devices are widely sold, in my opinion, the best method of preventing this damage is to cover beds or rows with netting, chicken wire, cloches or fleece.



## Pests

### Bean Seed Fly

I have seen poor germination of beans, and sometimes peas, become an increasing problem and samples returned by customers show that the Bean Seed Fly is often the culprit. The larvae are small, white maggots which attack the growing point and seed leaves of the bean as it attempts to germinate. If these attacks don't kill the bean then the fungal rots which tend to follow often do and, in many cases, the seedlings don't even emerge from the ground.

Problems like this are most likely to occur when beans are struggling to germinate in cold soil and seen less often when they are sown under glass or if sowing outside is delayed until the ground has warmed thoroughly. Attacks can also be prevented with an application of a suitable nematode product.





## Cutworms

Despite their name, these are not worms but the caterpillars of a moth which live in the surface layers of the soil and eat through the stems of seedlings at soil level. If they work their way along a row they can cause considerable damage. Control can be achieved with an application of a suitable nematode product or, if damage still occurs, a careful search of the soil near the damaged plants will often reveal the culprit.

## Mice

These rodents are very partial to pea and bean seeds and can quickly clear a whole row, again making it appear as if germination has failed. Where mice are known to be troublesome a remedy I use is to dip pea seeds in tea tree oil before sowing, while beans can be raised under glass or sown inside in bio-degradable pots that can be planted out once established. Alternatively, you may need to consider careful baiting.



## Slugs and Snails

These pests love the soft, juicy seedlings of many plants and will seek them out. A whole row of newly germinated cabbages or a pot full of young lettuce can mysteriously disappear overnight if a large snail finds them. Problems mostly occur in the garden but slugs in particular, also enjoy conditions in the greenhouse and can cause just as much damage there.

Various chemical baits are available but must be used with care as some are toxic to pets and other animals. Traps, often containing diluted beer and set slightly above soil level, will drown or collect many slugs which can be disposed of. In the greenhouse, good hygiene, particularly reducing places where they can hide during the day, will usually keep them under control.

## Diseases

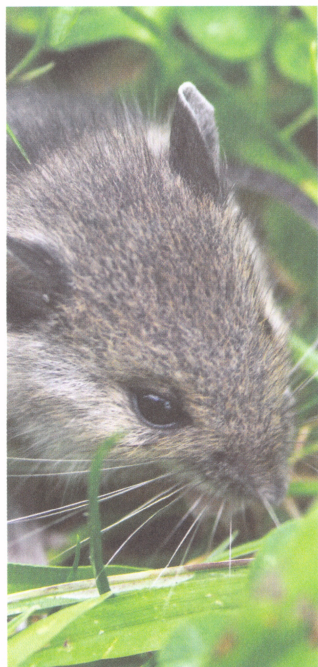
### Damping off

This is the number one enemy of young seedlings grown under glass. If the air circulation is poor damping off will occur and is caused by various fungi which live in the soil. Affected seedlings will rot off at soil level, suddenly collapsing and withering away.

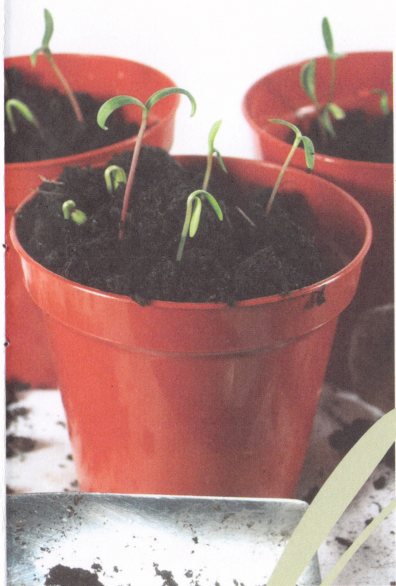
Healthy seedlings away from the edge of the affected patch can often be saved by transferring them to fresh compost but, once this problem appears, it is almost impossible to cure and so important to prevent occurring in the first place. The keys to doing this are clean containers, fresh compost and the use of tap water not rainwater. Compost can also be watered with a suitable fungicide



where seedlings are known to be susceptible. However, if these rules are observed, seeds are sown thinly and not over-watered, in most cases fungicide should not be necessary. It is certainly no substitute for good hygiene.







### Weak, leggy seedlings

Early spring sown seeds and ones grown on windowsills, especially over radiators where light comes from one side may become tall, thin and weak. This is caused by insufficient light combined with higher temperatures. Where possible, you need to move them to a position where they receive more light and to reduce the temperature. When pricking out or potting on these seedlings, the problem can often be corrected by planting them deeper than previously, as long as their lowest leaves are still above the surface of the compost.

### Sunscorch

Even early in the year, sun shining directly through glass can have a burning effect on delicate seedlings. In an unventilated greenhouse, propagator, coldframe or cloche this can result in temperatures well above safe levels for your seedlings. The problem becomes more acute as the season progresses and the sun gets stronger. Seedlings can then easily be scorched, particularly if they are touching the glass or have droplets of water on the leaves. For this reason, young seedlings under glass should not be placed where they will be in full sun, even for part

of the day, and adequate ventilation must be provided on sunny days to prevent temperatures rising to a damaging level.

### Weeds instead of plants

Every year I receive a few letters complaining that weeds have appeared with, or instead of, the expected seedlings. The usual reason for this is contamination of the compost or seedbed rather than any problem with the purity of the seeds. With my good reputation at stake, I wouldn't supply weed seeds instead of the variety purchased!

Modern general purpose composts are not sterilised and can quite often contain dormant weed seeds. These seeds are also common in most garden soils while other seeds can blow in on the wind or be introduced with manure. The very act of preparing seed trays or a seedbed can provide these seeds with the ideal conditions for germination. On some, rare occasions, these seeds may germinate while mine, for some reason, do not. Sometimes, the 'weeds' can be the result of self-sown seeds from other flowers, such as larkspur or poppies, making it appear as though I have supplied the wrong variety.

## Other problems

### Abnormal growth or development

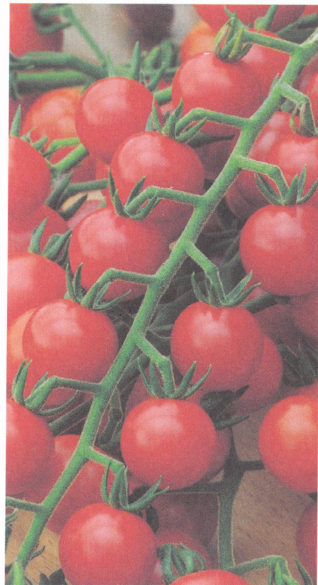
I sometimes receive reports of plants growing to different heights or maturing at different rates than stated on our packets. All I can say is that, as living things, plants are very much subject to the conditions under which they find themselves. The notes on seed packets are for guidance only and no seed company can guarantee that a particular variety will perform in exactly the same way in all summers, on all soils and in all parts of the country.

### Capping

On some soils you may find that a crust or cap forms on the surface after heavy rain or watering. This can make it very difficult for smaller seeds to germinate. If a cap forms soon after you have sown and before your seeds have started germinating, you will need to gently break it up. I suggest that the best way to avoid the problem is by using general purpose compost rather than soil to cover your seeds.







## Some terms & Abbreviations explained

### Annual

An annual is a plant that completes its full lifecycle, from germination, through flowering and seed production to death, within one growing season. These plants can only be grown from seed.

### AGM

This stands for the Award of Garden Merit and it is given by the Royal Horticultural Society to species and varieties which have performed outstandingly well in their trials.

### Biennial

A biennial is a plant that completes its full lifecycle in two years, flowering and dying in its second season.

### F1

There are a number of seed varieties which have F1 after the name of the plant. This refers to the fact that the plant is a hybrid produced by crossing two carefully selected parents of the same

species that have been developed through a process of self-fertilisation or 'inbreeding' over a number of generations. F1 varieties are normally both more uniform and vigorous than normal open-pollinated varieties. Regrettably, due to the complex breeding involved, they are also more expensive and seed saved from the plants will not replicate the uniformity of the first sowing.

### F2

When an F1 hybrid self-fertilises or is crossed with another F1 hybrid, the result is referred to as an F2. F2 varieties retain some, though by no means all, of the vigour and uniformity of the F1 parent(s). These hybrids often have other desirable features and are generally cheaper than the F1.

### Half-hardy

These types of plant will tolerate ordinary garden conditions in the warmer months but are not able to survive frosts.

### Hardy

Hardy plants can tolerate outdoor conditions at all times of the year without the need for protection.

### NIAB

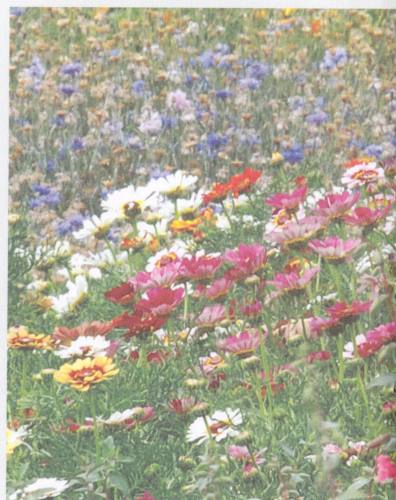
This refers to a variety that has been recommended by the National Institute of Agricultural Botany.

### Perennial

A perennial plant is capable of living for a minimum of three seasons. All herbaceous plants, trees, shrubs and bulbs are perennials.

### Tender

Tender plants cannot tolerate cold conditions. They originate from tropical or sub-tropical areas and like warmth at all times and will not survive if the temperatures drop below 5°C. As a result, they are only suited to indoor cultivation except in the warmest summer weather.





# why grow mr. fothergill's seeds?

**M**y company offers one of the widest selections of flower and vegetable seeds available anywhere. You will also find many of the best modern varieties, some more unusual species, classic varieties, organically grown seeds and mini vegetables in the range. Some of the varieties are exclusive and I aim to introduce exciting new ones each year.

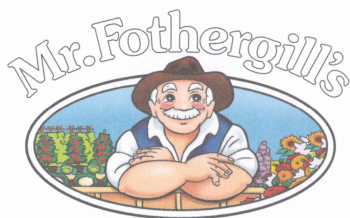
- While you may be able to find cheaper packets of some varieties, I believe that my seeds offer excellent value, especially when the quality and number of seeds in a packet are taken into account.
- Mr. Fothergill's were the first major seed company to state the average contents on all the seed packets and continue to do so today. The number of seeds in a packet can vary enormously, depending on the cost of that particular variety, but with my seeds, you always know exactly what you are getting.



- To maintain the highest standards of quality control, samples from all the batches of seed received are tested in our on-site laboratory as soon as they arrive after harvest. They must meet demanding standards of germination before I will release any of the remainder for packing and sale.
- All the seeds I sell are thoroughly cleaned and tested for purity and, as an additional check on their performance, samples are frequently sown and grown to maturity on our on-site trial ground.
- To give them extra protection, most of my seeds are sealed in airtight, inner foil sachets. Seeds packed in this way can remain fresh for at least two to three years when correctly stored and not opened.
- None of the seeds I sell are treated with any chemicals and none of the varieties have been developed through any kind of genetic modification.
- Finally, all my seeds are guaranteed. While you should remember that it is rare to achieve 100% germination with any seeds, particularly when they are sown directly into the garden, should any of the packets which bare my name genuinely give results which are below expectations, I will gladly replace them.







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